



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/054,438

01/22/2002

Gregory D. U'ren

00CON134P-DIV

7270

25700

7590

03/15/2005

FARJAMI & FARJAMI LLP

26522 LA ALAMEDA AVENUE, SUITE 360

MISSION VIEJO, CA 92691

EXAMINER

PHAM, LONG

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 03/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/054,438	Applicant(s) U'REN, GREGORY D.	
	Examiner Long Pham	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-47 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 46 and 47 is/are allowed.
- 6) ☒ Claim(s) 18-22, 24-40 and 42-45 is/are rejected.
- 7) ☒ Claim(s) 23 and 41 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Rejections and/or objections necessitated by the amendments

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 18, 19, 20, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA).

With respect to claim 18, AAPA teaches a structure comprising:

a base comprising a single crystal silicon-germanium. see pages 2-5 of the specification of this application; and

a base contact comprising polysilicon. see pages 2-5;

AAPA fails to explicitly teach a collector comprising of single crystal silicon adjacent to the base.

However, the formation of a collector comprising of single crystal silicon adjacent to a base in formation of a si-ge based HBT is well-known to one of ordinary skill in the art of making semiconductor devices.

AAPA further fails to explicitly teach an emitter comprising of polysilicon adjacent to the base.

However, the formation of an emitter comprising of polysilicon adjacent to a base in formation of a si-ge based HBT is well-known to one of ordinary skill in the art of making semiconductor devices.

Also with respect to claim 18, the processing limitation of "wherein said base contact and said base are characterized by a controlled deposition ratio" is not given weight in the determination of patentability of structure claim 18.

Also with respect to claim 18, since AAPA teaches the claimed structure and since the claimed base contact and base are inherently characterized by a deposition ratio, the base contact inherently has a reduced resistance.

Note that the processing limitations recited in structure claim 18 have been given no weight in the determination of patentability of claim 18.

With respect to claims 19-22, the processing limitations recited in structure claims 19-22 have been given no weight in the determination of patentability of claims 19-22.

2. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA.

With respect to claim 24, AAPA fails the base contact resistance is 650 ohms per micrometer.

However, However, it would have been obvious to one of ordinary skill in the art of making semiconductor devices to determine the workable or optimal values for the base contact resistance through routine experimentation and optimization to obtain optimal or desired device performance because is result-effective variables and there is no evidence indicating that it is critical or produces any unexpected results and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

3. Claims 25, 27, 28, 29, 30, 31, 32, 33, 34, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA).

With respect to claims 25, AAPA teaches a structure for forming a heterojunction bipolar transistor comprising:

a single crystal region situated over a first area. see pages 2-5 of the specification of this application; and
a polysilicon region situated over a second area.

Also with respect to claim 25, the processing limitation of "wherein said polycrystalline region and said single crystal region are characterized by a controlled

Art Unit: 2814

deposition ratio" is not given weight in the determination of patentability of structure claim 25.

Also with respect to claim 25, since AAPA teaches the claimed structure and since the claimed base contact and base are inherently characterized by a deposition ratio, the base contact inherently has a reduced resistance.

With respect to claim 28, AAPA further teaches that the single crystal region comprises of silicon-germanium and the polysilicon region comprises polysilicon silicon-germanium.

With respect to claim 29, AAPA further teaches that the single crystal region or base is in contact in the polysilicon silicon-germanium or base contact.

With respect to claim 30, AAPA further teaches that the single crystal region is a base in a heterojunction bipolar transistor.

With respect to claim 31, AAPA further teaches that the polysilicon region is The processing limitations recited in structure claims 25, 27, and 32-35 have been given no weight in the determination of patentability of claims 25, 27, and 32-35.

4. Claims 36, 37-40, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA).

With respect to claim 36, AAPA teaches a structure comprising:
a base comprising a single crystal silicon-germanium. see pages 2-5 of the specification of this application; and
a base contact comprising polysilicon. see pages 2-5;
AAPA fails to explicitly teach a collector comprising of single crystal silicon adjacent to the base.

However, the formation of a collector comprising of single crystal silicon adjacent to a base in formation of a si-ge based HBT is well-known to one of ordinary skill in the art of making semiconductor devices.

AAPA further fails to explicitly teach an emitter comprising of polysilicon adjacent to the base.

However, the formation of an emitter comprising of polysilicon adjacent to a base in formation of a si-ge based HBT is well-known to one of ordinary skill in the art of making semiconductor devices.

Also with respect to claim 36, the processing limitation of "wherein said base contact and said base are characterized by a controlled deposition ratio" is not given weight in the determination of patentability of structure claim 36.

Also with respect to claim 36, since AAPA teaches the claimed structure and since the claimed base contact and base are inherently characterized by a deposition ratio, the base contact inherently has a reduced resistance.

Note that the processing limitations recited in structure claim 36 have been given no weight in the determination of patentability of claim 36.

Note that the processing limitations recited in structure claims 37-40 have been given no weight in the determination of patentability of claims 37-40.

5. Claims 42, 43, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA.

With respect to claim 42, AAPA fails the base contact resistance is 650 ohms per micrometer.

However, it would have been obvious to one of ordinary skill in the art of making semiconductor devices to determine the workable or optimal values for the base contact resistance through routine experimentation and optimization to obtain optimal or desired device performance because is result-effective variables and there is no evidence indicating that it is critical or produces any unexpected results and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

With respect to claim 45, the use of polysilicon as emitter material is well-known to one of ordinary skill in the art of making semiconductor devices.

With respect to amended claim 43, it is well-known that a base contact is located over base region.

Response to Arguments

6. Applicant's arguments with respect to claims 18-22, 24-40, and 42-45 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

7. Claims 46 and 47 are allowed.
8. Claims 23 and 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will

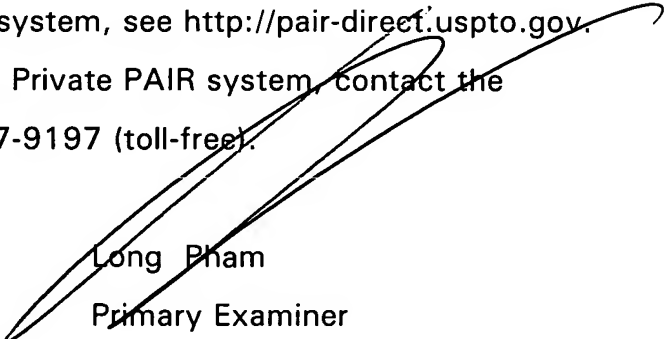
Art Unit: 2814

the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long Pham whose telephone number is 571-272-1714. The examiner can normally be reached on M-F, 7:30AM-3:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Long Pham
Primary Examiner
Art Unit 2814

LP